

Fauna:- Tolibar Beel is rich in faunal diversity include various types of aquatic birds and fishes. But due to several anthropogenic activities create threat to reduce these diversities. Dominant aquatic birds found were Sarali hah, Samukvanga, Bogoli, Dolghora, Pani Kauri, Dawk, Dolmoura, Dhak and seasonal migratory birds. Common fishes found in the beel were puthi, Mao, Daikana, Singi, Sal, Soul, cuchia, Borali, Dhekera etc.



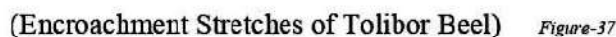
Tolibar Beel, Dhing

Figure-36

Issues :

Loss in aquatic Biodiversity: - Basically the beel is the home of various fauna and flora. Due to more human encroachment mainly for agricultural purpose using fertilizers, the quality of the water body starts to degrade which leads to decrease aquatic floras and faunas.

Extraction of fishes and Birds: - Extraction of fishes and illegal poaching of birds from it also increasing in present day. It harms the local fish species and extinction of some local species. In recent days due to illegal poaching of birds hamper the attraction of the water body for the migratory birds which are now decreasing day by day due to human presence and loss of natural vegetation. There is no doubt that Tolibar beel has every possibility to develop a site of recreation where people can enjoy the natural beauties and refresh themselves.



For wise use of water body resources, it is very important to assess the impact of socio-economic factors upon the water body environment in regards of management plan. For proper management resources several steps should be taken to protect the water body from encroachment and strict law should be implemented for their protection to illegal encroachment. Alternative means of livelihood should be generated for the people who depend upon water body resources for their survival. It will reduce the exploitation of water body resources and killing of fish and fauna. Efforts should be made to educate the local people and create awareness about the importance of management and conservation of this water body. Successful management of water body resources depends upon how properly concern authorities adopt appropriate plan and in what way it should be implemented.

Moreover, there are several water bodies and wetland rich in Aquatic Living beings within the Dhing planning area which are to Manage, conserve and preserve.

Proposal:-

As the Beel is rich in Biodiversity and have a unique ecosystem, it should be conserve, preserve and manage. So for the purpose of its conservation, some portion of this Beel may be declared as eco-sensitive Area or Zone. For Management and recreational activities, eco-tourism Park may be developed and riverfront development project can be taken up for its conservation and preservation.

7.2 HISTORICAL SITES OR A PLACE:-

A historic site or heritage site is an official location where pieces of political, military, cultural, or social history have been preserved due to their cultural heritage value. Historic sites are usually protected by law, and many have been recognized with the official national historic site status. A historic site may be any building, landscape, site or structure that is of local, regional, or national significance. Usually this also means the site must be at least 50 years or older.

Batadrava Than:-

It is located at distance of 12.5 Km from Dhing Town and takes 25 minutes only. Batadrava Than is the first Than or the first institution set up by Srimanta Sankaradeva for propagation of eka sarana nama dharma founded by him. He also built the 'Monikut' together with Kirtanghar or Namghar and the 'Cari-Hati' (four clusters of quarters) for accommodation of his disciples. This full-fledged Than complex came up in 1509. Simhasana or Guru Asana (altar of God) was placed in the Monikut with the Holy Scripture 'Bhagavata' on it without any idol. Srimanta Sankaradeva used to practise Nama Prasanga regularly in the Kirtanghar along with his follower devotees. His religion EKA SARANA NAMA DHARMA is very simple. There is no unnecessary ritual in his order. Srimanta Sankaradeva advocated 'EKA DEVA, EKA SEVA, EKA BINEY NAHI KEWA', which means one should worship none but one God, who is Lord Krishna. Batadrava or Bordowa became the centre of his religious activities. As such, Batadrava has been regarded as the Dvitiya Vaikuntha .



(Borpuwa)

figure-38

7.3 PROPOSED STRATEGIES

Heritage sites Management and organizational structure

There is a need to setup a Heritage Committee for Dhing Planning Area. The concerned Development authorities/municipalities as well as local stakeholders, NGO, s have significant role to play in successful implementation of strategies proposed for Dhing Areas. Formulations of special regulations to control or mediate development within the available heritage areas are a prerequisite for effective implementation of the proposed recommendations. Special regulations for all development within heritage areas, including new construction, demolition or modification to existing buildings around historic structures or within historic precincts must be formulated by the concerned authority with the advice of Heritage Committee. Detailed plans must be prepared by respective Municipalities. It is necessary to prepare an inventory of build, cultural and natural heritage resources of the special areas. The inventory must include both protected and unprotected resources. The cost for most of the new developments in special heritage areas in already covered in budget allocation for "Tourism, Recreation and Culture" and hence not included in this table. Estimates for projects those are specific for preservation of heritage resources are only included. River Front Development is treated as a separate item of budgetary allocation.

The relevant policy guidelines and management of culture and natural heritage can rejuvenate and revitalize the Dhing region and support the existing cultural identity. It can also promote tourism, boost local economy and contribute a great sense of pride amongst the residents and became a touchstone for future development.

7.4 STRATEGIES FOR DEVELOPMENT OF RECREATIONAL AREAS:

Recreation is any physical or psychological revitalization through the voluntary pursuit of leisure time. It is an activity which is relaxing to people and provide diversions from their normal routine. Generally there are four types of Recreational activities:

Revitalization: Restoration and enhancement of mental and physical health.

Play:-relaxation and exercise

Adventure: - Excitement and challenge

Education: organized and incidental

Indoor Facilities consist of library, clubs, cinema hall, auditorium, multiplex, art and craft centre, shopping mall, food courts, cyber, gymnasium etc.

Outdoor recreation facilities consist of gardens, parks, playground, golf courses, zoo, and botanical garden, race course, stadium, exhibition ground, water sports complex, green ways etc.

Proposal for augmentation and development of Recreational Facilities

1. Development of green belts, plantation, parks, ghats, plazas, along the riverfront abreast the urban set up and invite nature harsh environment through myriad ways.
2. Amusement parks to be developed along with horticulture, pisi-culture, herbal arks, etc.
3. Development of eco-tourism with provision of water theme parks, lagoon resorts, weekend resorts, clubs, etc. at Planning area level.

Proposed strategies to boost tourism

As a service industry, tourism has numerous tangible and intangible elements. Major tangible elements include transportation, accommodation, and other components of a hospitality industry. Most intangible elements relate to the purpose or motivation for becoming a tourist, such as rest, relaxation, the opportunity to meet new people and experience other cultures, or simply to do something different or have an adventure.

Tourism is vital for every place, due to the income generated by the consumption of goods and services by tourist, the taxes levied on business in the tourism industry, and the opportunity for employment and economic advancement by working in the industry. For these reasons government and private agencies sometimes promote a specific region as tourist destination, and support the development of advancement by working in the industry. For these reasons government and some private agencies sometimes promote a specific region as tourist destination, and support the development of a tourism industry in that area. The contemporary phenomenon of mass tourism may result in overdevelopment; however alternative forms of tourism such as ecotourism seek to avoid such outcomes by pursuing tourism in a sustainable way.

Dhing Region offer substantial potential for tourism development. Batadrava Than which is 12.5 Km away from Dhing Town is the centre for cultural and Historical sites for the entire state and also for the whole country. Moreover, Lowkhowa Wildlife Sanctuary is situated at a distance of 33 Km from the Dhing Town. This wildlife sanctuary covers 70.13 km², on the south bank of the Brahmaputra River in Nagaon district, It is situated 40 km downstream of the Kaziranga National Park and 30 km northwest of the Orang National Park on the other side of the river Brahmaputra.

It is a part of the Laokhowa-Burachapori eco-system. The sanctuary is an ideal habitat for Indian rhinoceros and Asiatic water buffaloes. Other animals found here are the royal Bengal tiger, Indian leopard, Indian boar, civet, leopard cat, hog deer, etc. Over 200 species of birds have been recorded in the sanctuary, including migratory birds. Laokhowa had more than 70 Indian rhinos in early 1980s which were all killed by poachers. In 2016, two rhinos were reintroduced to the sanctuary from Kaziranga National Park as part of the Indian Rhino Vision 2020 (IRV 2020).



Laokhowa wildlife Sanctuary

Figure-39



Figure-40

7.5 CITY BEAUTIFICATION PLAN/ PROPOSALS

Roadside plantation

Roadside plantation acts as a buffer between the people and government- owned forests, and it will help to reduce the extensive indiscriminate destruction of forests. Roadside tree planting can make significant improvements to the quality of roads and the environment and can protect key natural resources, especially in ASAL regions where vegetation is essential in binding the soil with organic matter that aids in enhanced infiltration and water retention in the soil.

Planting trees along the road sides, highways and pathway is known as avenue plantation. Avenue plantation is generally practiced for the aesthetic value, Beautification, shade purpose, control of soil erosion and for its economic use of timber, flowers & fruits. Best trees for roadside plantation are Neem, Krishna Chura, Radha Chura, Sonaru etc. Trees also give us fresh air as they produce oxygen. Trees are planted along the roadside as they provide shade to the travellers during summers.

Below table shows the Proposal of Roadside tree Plantation alongside the major Road of Dhing Town Area.

Table:-54

SL.No	Name of the Road	Length (approx....)
1	Puja Bari Road (Both Side)	0.61 Km
2	Dhing Tuktuki Jajori Road (Both side)	0.91 Km
3	Nagaon Dhing Bhuragaon Road (Both side)	2.00 Km
4	Dhing Road (Both side)	1.00 Km
5	Bhakatgaon Road (Both side)	0.40 Km

(Source-Dhing M.B)

Requirements and strategies:-

- (a) One Kind of Flowering Trees on Both Sides
- (b) Two Kinds of Flowering Trees Blooming at one Time on both Sides of Road
- (c) Two Kinds of Flowering Trees Blooming at Different Time on both Sides of the Roads
- (d) Shady Trees Only on both Sides of Roads.
- (e) The trees should be planted at least 12 m apart from the center of the carriageway.
- (f) If the road is constructed on the embankment, the trees should be planted as possible as high on the sides of the embankment.

7.6 URBAN AGRICULTURE AND URBAN FORESTRY:

Urban agriculture, urban farming, or urban gardening is the practice of cultivating, processing, and distributing food in or around urban areas. Urban agriculture is also the term used for animal husbandry, aquaculture, urban beekeeping, and horticulture. These activities occur in peri-urban areas as well. Peri-urban agriculture may have different characteristics.

Urban agriculture can reflect varying levels of economic and social development. It may be a social movement for sustainable communities, where organic growers, "foodies", and "locavores" form social networks founded on a shared ethos of nature and community holism. These networks can evolve when receiving formal institutional support, becoming integrated into local town planning as a "transition town" movement for sustainable urban development. For others, food security, nutrition, and income generation are key motivations for the practice. In both scenarios, more direct access to fresh vegetables, fruits, and meat products through urban agriculture can improve food security and food safety.

Types of Urban Farming

Backyard Gardens:-

This is the growing of food on home property. ...

- (a) Tactical Gardens. This involves using the limited space available to practice agriculture without having to incur hefty expenses.
- (b) Street landscaping.
- (c) Forest gardening.
- (d) Greenhouses.
- (e) Rooftop gardens.
- (f) Green walls Vertical farms.

Strategies

- (a) Allotment gardens: An allotment garden is a plot or parcel of urban or suburban land made available for individual, non-commercial gardening or food growing and recreation.
- (b) Community gardens: Community gardens are an emerging form of urban farming.
- (c) **Inventory of your town land and rooftops.**
- (d) **Partnerships and Cultivate market access.**

Urban forestry is the care and management of single trees and tree populations in urban settings for the purpose of improving the urban environment. Urban forestry involves both planning and management, including the programming of care and maintenance operations of the urban forest. Urban forestry advocates the role of trees as a critical part of the urban infrastructure. Urban foresters plant and maintain trees, support appropriate tree and forest preservation, conduct research and promote the many benefits trees provide. Urban forestry is practiced by municipal and commercial arborists, municipal and utility foresters, environmental policymakers, city planners, consultants, educators, researchers and community activists. The urban forestry comprises all green elements under urban influence such as, Street trees and road plantations, Public green areas, such as parks, gardens, cemeteries, Semi-private space, such as green space in residential areas and in industrial or specially designated parks.

Strategies

- (a) Increase tree planting in neighbor hoods with low urban forest cover.
- (b) Increase Street and park tree diversity.
- (c) Plant trees to support green infrastructure and reduce climate change
- (d) Enhance biodiversity through tree planting.
- (e) Update inventory and data management for public trees.
- (f) Manage public trees for public safety and support tree health.
- (g) Work together with local people and the urban NGO related to forestry.
- (h) Raise awareness of the importance of the urban forest.
- (i) Support volunteers, NGOs, schools, and neighborhood groups in urban forest stewardship.

7.7 PUBLIC RAIN WATER HARVESTING SCHEME:

Rainwater harvesting (RWH) is the collection and storage of rain, rather than allowing it to run off. Rainwater is collected from a roof-like surface and redirected to a tank, cistern, deep pit (well, shaft, or borehole), aquifer, or a reservoir with percolation, so that it seeps down and restores the ground water.

Harvesting rainwater allows the collection of large amounts of water and mitigates the effects of drought. Most rooftops provide the necessary platform for collecting water. Rainwater is mostly free from harmful chemicals, which makes it suitable for irrigation purposes. There are two ways of harvesting rainwater, namely; surface runoff harvesting and rooftop rainwater harvesting.

There are two major techniques of rainwater harvesting.

Surface runoff harvesting:-

In this method, rainwater flows away as surface runoff and can be stored for future use. Surface water can be stored by diverting the flow of small creeks and streams into reservoirs on the surface or underground. It can provide water for farming, for cattle and also for general domestic use. Surface runoff harvesting is most suitable in urban areas.

Rooftop rainwater/storm runoff can be harvested in urban areas through:

- Recharge Pit
- Recharge Trench
- Tube well
- Recharge Well

Groundwater recharge

Groundwater recharge is a hydrologic process where water moves downward from surface water to groundwater. Recharge is the primary method through which water enters an aquifer. The aquifer also serves as a distribution system. The surplus rainwater can then be used to recharge groundwater aquifer through artificial recharge techniques.

Rainwater in rural areas can be harvested through:

- Gully Plug
- Contour Bund
- Dugwell Recharge
- Percolation Tank
- Check Dam/Cement Plug/Nala Bund
- Recharge Shaft

Although rainwater harvesting measure is deemed to be a desirable concept since the last few years, it is rarely being implemented in rural India. Different regions of the country practiced a variety of rainwater harvesting and artificial recharge methods. Some ancient rainwater harvesting methods which includes Madakas, Ahar Pynes, Surangas, Taankas, etc.

Water Harvesting Schemes in india

Steps taken by the Central Government to control water depletion and promote rain water harvesting / conservation are as under:

1. Government of India launched Jal Shakti Abhiyan (JSA) in 2019, a time bound campaign with a mission mode approach intended to improve water availability including ground water conditions in the water stressed blocks in India. Ministry of Jal Shakti visited water stressed districts and to work in close collaboration with district level officials to undertake suitable interventions. In addition, 'Jal Shakti Abhiyan – Catch the Rain' campaign has been launched by Hon'ble Prime Minister of India on 22 March 2021.

2. National Water Policy (2012) has been formulated by Department of Water Resources, RD & GR; inter-alia advocates rainwater harvesting and conservation of water and highlights the need for augmenting the availability of water through direct use of rainfall. It also inter-alia, advocates conservation of river, river bodies and infrastructure should be undertaken in a scientifically planned manner through community participation. Further, encroachment and diversion of water bodies and drainage channels must not be allowed and wherever, it has taken place, it should be restored to the extent feasible and maintained properly.

3. In compliance to the decision taken by the Committee of Secretaries, an 'Inter Ministerial Committee' under the Chairmanship of Secretary (WR, RD & GR) has been constituted to take forward the subject of 'Push on Water Conservation Related Activities for Optimum Utilization of Monsoon Rainfall'.

4. Ministry has circulated a Model Bill to all the States/UTs to enable them to enact suitable ground water legislation for regulation of its development, which also includes provision of rain water harvesting.

5. Master Plan for Artificial Recharge to Groundwater- 2020 has been prepared by CGWB in consultation with States/UTs which is a macro level plan indicating various structures for the different terrain conditions of the country including estimated cost. The Master Plan envisages construction of about 1.42 crore Rain water harvesting and artificial recharge structures in the Country to harness 185 Billion Cubic Metre (BCM) of monsoon rainfall.

6. CGWB has taken up Aquifer Mapping and Management Programme during XII Plan, under the scheme of Ground Water Management and Regulation. The Aquifer Mapping is aimed to delineate aquifer disposition and their characterization for preparation of aquifer/ area specific ground water management plans with community participation. The management plans are shared with the respective State governments for taking appropriate measures / implementation.

7. Best practices of water conservation by various entities including private persons, NGOs, PSUs etc have been compiled and put on the web site of the Ministry for the benefit of general public. An interactive link on best practices has also been created for receiving inputs from public, which, after necessary evaluation/validation are put on the website for the benefit of the public.

8. Department of Water Resources, RD& GR has instituted National Water awards to incentivize good practices in water conservation and ground water recharge.

9. Mass awareness programmes (Trainings, Seminars, Workshops, Exhibitions, Trade Fairs and Painting Competitions etc.) are conducted from time to time each year under the information, Education & Communication (IEC) Scheme of DoWR, RD & GR in various parts of the Country to promote rain water harvesting and artificial recharge to ground water.

10. The Ministry of Rural Development in consultation and agreement with the Department of Water Resources, RD & GR and the Ministry of Agriculture & Farmers' Welfare has developed an actionable framework for Natural Resources Management (NRM), titled 'Mission Water Conservation' to ensure gainful utilization of funds. The Framework strives to ensure synergies in Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS), Pradhan Mantri Krishi Sinchayee Yojana (PMKSY), erstwhile integrated Watershed Management Programme (IWMP) now PMKSY Watershed Development Component and Command Area Development & Water Management (CADWM), given their common objectives. Types of common works undertaken under these programmes/schemes are water conservation and management, water harvesting, soil and moisture conservation, groundwater recharge, flood protection, land development, Command Area Development & Watershed Management.

11. Central Government supports construction of water harvesting and conservation works primarily through Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) and Pradhan Mantri Krishi Sinchayee Yojana – Watershed Development Component (PMKSY-WDC).

12. Atal Bhujal Yojana (ABHY), a Rs.6000 crore scheme with World Bank funding, for sustainable management of ground water with community participation is being taken up in the identified over-exploited and water stressed areas fall in the States of Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan and Uttar Pradesh. This scheme is expected to contribute significantly towards water and food security of the participating states.

7.8 STRATEGIES AT LOCAL LEVEL:

At local level, Urban Local Body/Municipal Board in compliance with Rain water Harvesting should strictly follow the Government Guidelines, Circulars, Manual, model circulated time to time. In different Structural construction, Planning, Drawing, there should be the provision of Rain water harvesting system. In this regards, authority related to the permission of construction of Houses, Building, Structure should follow the rules, Byelaws of Building rules. Regarding rain water harvesting in the Dhing Planning Area, Dhing Municipal Board should strictly follow the Building Rules-2014 Govt. of Assam in issuing Building construction permission and also to create Public awareness among people of the locality in rain water harvesting techniques.

Development of parks and recreational spaces with Identification and demarcation of Open Space for sports, Cultural function, fairs etc. in Dhing Planning Area:-

Due to rapid growth of population, the present recreational facilities are not sufficient to fulfil the needs of the people of the Dhing Town. In Dhing Town there is only one organized Parks that is Dhing Children Parks for the Children is to developed with all Modern facilities.

Proposal for Construction of Playground Infrastructure and Parks & other recreational Facilities in Dhing Planning Area:-

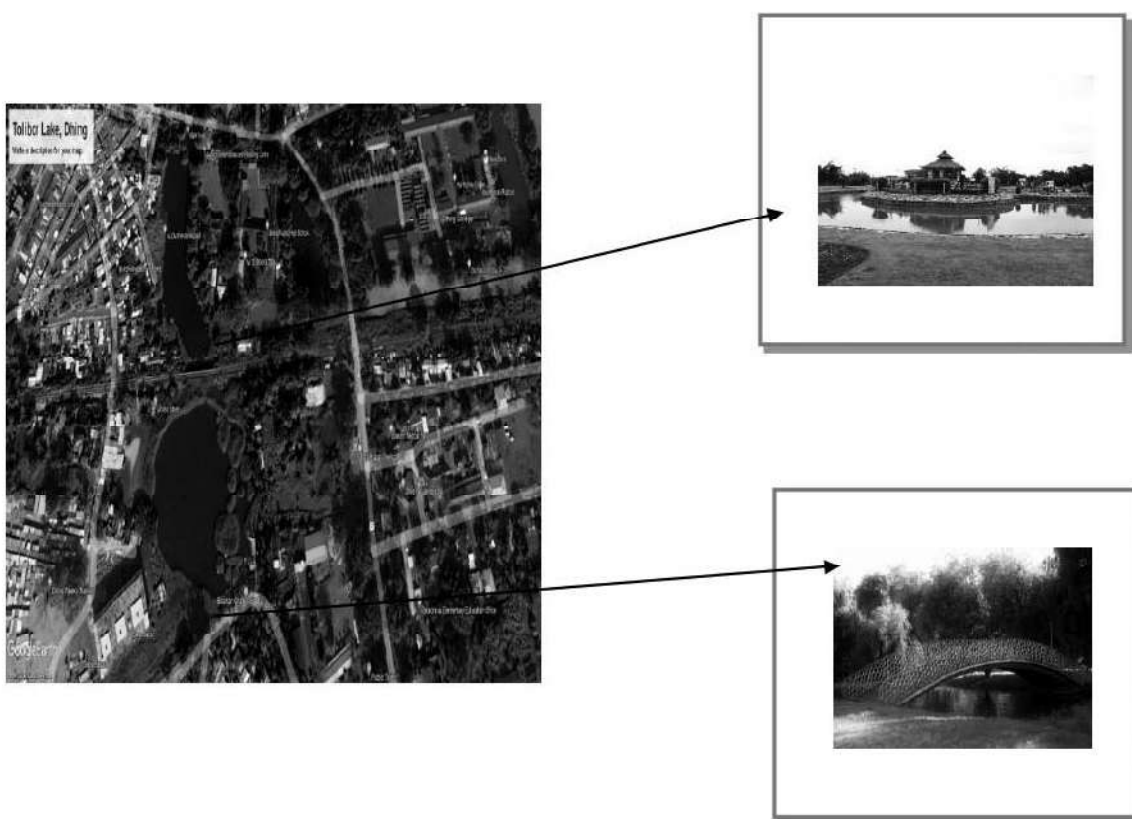
Table 55:-

SL. No	Name of the Open space/ site	Proposal
1	Jaganath playground	Development of a Mini stadium with spectators galleries and modern facilities
2	Suitable Plot of land within Dhing Municipality Area	Construction of Public Auditorium with all modern facilities.
3	Suitable Plot of land within Dhing Municipality Area	Construction of Open theatre with all modern facilities
4	Suitable Plot of land within Dhing M.B	Proposal for construction Modern Marks within the Dhing Municipal Board.
5	Suitable Plot of land within the each Revenue Village.	Proposal for construction of 1 Children Parks and 1 Community centre at each Revenue village of the Dhing Planning Area.

(Source-Dhing Municipal Board)

Infrastructure Proposal

- (1) Automatic Traffic Signal point at Dhing Bazar Tiniali and Dhing Chariali
- (2) Automatic Traffic Signal point at connecting point between pujabari and Dhing-Jajari Road
- (3) Clock Tower at Dhing Chariali, Entrance Gate at Chamuagaon near Sub-Post Office and Dhing Chariali
- (4) Eco-Tourism Park at Tolibor Lake
- (5) 3 Nos. of Footbridge over Tolibor Beel

*Figure- 41*

Proposal for construction of Eco-Tourism Park and Bridge at Tolibar Beel

CHAPTER LAND USE PLAN

8.1 EXISTING LAND USE OF DHING MASTER PLAN AREA -2021:

The study of land use holds a very significant place where a particular settlement can be recognized as a town depends on its functional structure. The functional activity can be regarded as the main regions for the growth of urban center. The main purpose of land use study is to provide framework for the development of a particular area. It gives us an idea about the proportion of various types of land.

Land use gives an accurate picture of an urban area which is having great significance for future planning. The main purpose of land use classification is to provide framework for the development of a particular area. The need for studying the land use aspect is elaborated as follows: To know the arrangement of various parts of town put to different uses such as residential, commercial, industrial etc.

The Existing Land Use pattern of Dhing Master Plan Area was updated based on ground reality on the scientific base map prepared with the help of Satellite Image and Revenue records like village level cadastral sheets, Field Measurement Book sheets and Town Survey Sheets. The Dhing Planning Area is administratively divided into two entities, Urban and Rural. Urban area comprises of Dhing Municipal Board area of 14.10 Sq. Km and Rural area of 24.24 Sq. Km including 12 Villages. This chapter presents the existing land use analysis, 2021 for the planning area.

As a part of the preparation of GIS Based Master Plan- 2045, the study of the existing Land use pattern of Dhing Master Plan area was carried out by a survey conducted by T&CP, District Office, Nagaon in order to formulate future policies so that a balanced approach can be made in allocating the future land uses.

The existing land-use in Dhing Master plan area has been grouped into the following 8 (Eight) categories.

Table 56: Existing Land use of Dhing Master Plan Area

Sl. No.	Land use category	Area(Sq. Km)	% of Total Developed Area	% of the Planning Area
1	Residential	10.00	69.44	26.08
2	Commercial	0.22	1.53	0.57
3	Public & Semi Public	1.55	10.76	4.04
4	Industrial	0.28	1.94	0.73
5	Transportation	1.26	8.75	3.29
6	Recreational/Open space	1.09	7.57	2.84
	Total Developed Area	14.40	100.00	37.56
7	Agriculture	21.69		56.57
8	Water Bodies	2.25		5.87
	Total Undeveloped Area	23.94		100.00
	Grand Total	38.34		

Source: - Consultancy

Pie Diagram showing Category-wise Existing land-use Pattern of Dhing Master Plan Area

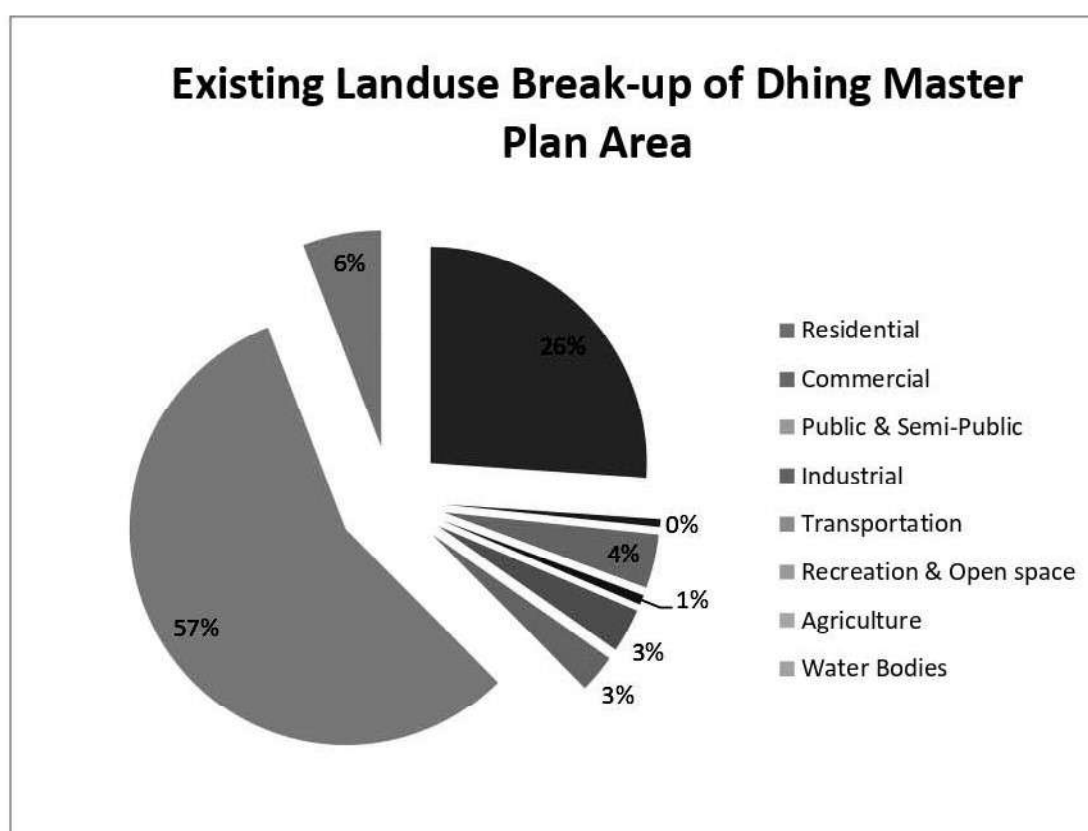


Figure-42

The detailed land use analysis of the Dhing Master Plan Area-2045, gives the picture of the shape of the Urban and Rural land for various activities. From the above table it is seen that out of the total land, Agriculture land use being the predominant land use which occupies 21.69 Sq. Km. (56.57 %) of the total planning area, residential land use is spread over 10.00 Sq. Km. (26.08 %). Out of the undeveloped land area about 2.25 Sq. km (5.87%) occupies by water bodies covered by Leteri Beel, some ponds and wetlands like Tolibor Beels etc.. It is also observed that about 1.26 Sq. Km (3.29 %) areas occupies by Transportation including Roads and Railway. Public and semi-public occupies 1.55 Sq.km. (4.04%) for various Physical and social infrastructure like Educational institutes, Government Offices, Hospitals, District and Special jails, Circuit House, Govt. Residential Buildings etc. Km. 0.22 sq.km (0.57%) occupies by commercial use.

It is also seen that about 0.28 Sq. Km (0.73 %) of land occupies by industrial use. From the table it is seen that there is huge scope of future development of the planning area. The rural area has concentration of good amount of Agricultural land, open space and water bodies and urban area also has large amount of vacant land and open spaces. Thus the Planning area has a good scope of development of existing residential buildings and construction of new residential buildings or redevelopment in conformity with the heritage importance and special regulations for the Planning Period up to 2045.



CHAPTER 9: PROPOSED LAND USE PLANE:

On the basis of planning policies, techniques, principles and projections, various recommendations and proposals for the future growth of Dhing Master Plan Area have been formulated. As such recommendation and proposals have been translated into land use plan to give them spatial dimension. The land use shown in the map indicates the functional relationship between various urban activities visualized up to 2045 and aims at to provide the most economics use of urban land.

The land requirement for various urban activities have also been proposed on the basis of projected population of 1,13,645 by 2045. The distribution of land into various broad categories of land use have been made keeping in view the minimum desirable standards of development and functional linkages between them. The following table shows the land proposed for various major uses.

9.1 PROPOSED LAND USE IN DHING MASTER PLAN AREA:

The Proposed Land use in Dhing Master Plan Area for 2045, considering all the above analysis can be summarized as below:

Table 57: Existing and Proposed Land Use classifications for different uses of Dhing Master Plan, 2045

Sl. No.	Land use Category	Area (in Sq. Km.)	% of Total Developed Area	% of the total Planning Area
1	Residential	13.88	63.12	36.20
2	Commercial	0.87	3.96	2.27
3	Public & Semi Public	1.56	7.09	4.07
4	Industrial	0.68	3.09	1.77
5	Composite Use	0.15	0.68	0.39
6	Transportation	2.2	10.00	5.74
7	Recreational Proposed	2.65	12.05	6.91
	Total Developed Land	21.99	100%	57.36
8	Agriculture	14.05		36.65
9	Green Belt Proposed	0.06		0.16
10	Water Bodies	2.24		5.84
	Total Master Plan Area	38.34		100.00

(Source-Consultancy)

9.2 PROPOSED RESIDENTIAL USE:

To accommodate the projected population of about 1,13,291 an area of about 13.88 sq. km. are earmarked for residential use in Dhing Master Plan Area. The plan provides the following pattern of residential density.

The area under Dhing Master Plan 4 (Four) Town Planning Scheme (TPS) project is proposed at Auni-Ati Satra, Athgaon Chapori, Dhakaya Basti and 2 (Two) Local Area Project at Ward No 7 & 9. Town Planning Scheme with affordable housing is proposed at Ward No-3

Town Planning Schemes (TPS):-

The basic concept of Town Planning Schemes is pooling together all the land under different ownerships and redistributing it in a properly reconstituted form after deducting the land required for open spaces, social infrastructures, services, housing for the economically weaker section, and road network. A town planning scheme of the local government made under the Town Planning and Development Act 1928.

Conceptually, town planning scheme is a joint land development project undertaken by the owners. Planning authority steps in as an agent on behalf of owners provides for smooth vesting of lands to planning authorities for public purposes.

The basic concept of the TP Scheme is to pool together all the land (typically ranging from 100 to 200 hectares) under different ownerships and redistribute it in a properly reconstituted form after carving out the required land for open spaces, social infrastructure, services, housing for the economically weaker section etc.

Principles of Town Planning Schemes:

The basic principles of Town Planning Schemes are summarized as mentioned below:

- Lands pooled and reconstituted according to some equitable formula.
- Loss of land because of reservation
- Dispossession kept at bare minimum
- Reconstituted plots: buildable

- Increments, incremental contribution – maximum 50%
- Cost of Scheme: minimum as far as possible
- Urban land should itself resource the cost of development
- Town planning scheme has been provided with an in-built mechanism for arbitration.
- Conceptually, town planning scheme is a joint land development project undertaken by the owners.
- Planning authority steps in as an agent on behalf of owners.
- Provides for smooth vesting of lands to planning authorities for public purposes.
- General opposition to acquisition from owners is not existent, therefore, rightly called as ‘land acquisition without tears.’
- For implementation of D. P. proposals

Tentative time-frame for Town Planning Schemes (TPS):

- Making and publishing draft scheme from date of intention declaration 9 months
- Extension that may be granted 3 months Submission of scheme after publish 3 months
- Sanction of Draft Scheme by the State Government 3 months
- Appointment of T. P. O. ½ month Making of Preliminary & final scheme 12 months
- Extension that may be granted 6 months
- Sanction of Preliminary / Final scheme 2/3 months
- Scheme to come into force 1 month
- Approximate time for finalization of a TPS 50 months

Procedure to prepare a Town Planning Schemes (TPS):

- A TPS (u/s 40(2)) may be made on land which is, in the course of development likely to be used as residential, commercial or industrial or building already built upon.
- After identifying area for TPS, the authority through board resolution is required to take CTP’s consultation u/s 41(1) and declare its intention to make a scheme within nine months, the authority is required to prepare and publish the scheme in official gazette.

- 1) **TPS-I, Athgaon Chapori**
- 2) **TPS-II, Auni-Ati Satra**
- 3) **TPS with Affordable Housing at Ward No-3**
- 4) **TPS III, Dhakaya Basti**

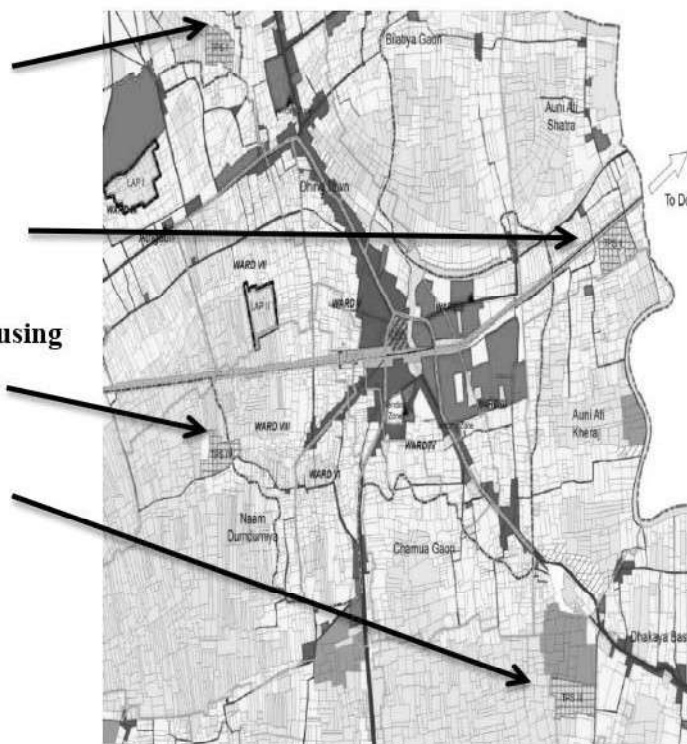


Figure-43

LOCAL AREA PLAN (LAP):

Local area planning is a process of planning that is concerned with resolving local level problems and issues. Its priorities include overall welfare of the people and development of the local area. Maintenance of social services and amenities, promotion in the quality and quantity of local products and services and keeping surroundings and local environment clean and green are some of its continuous concerns. In terms of size, it is the smallest planning unit with reference to people and places. A planning which is carried out through people's participation turns out to be a dream of real situation reflecting continuous growth and development in the local area.

The function of a local area plan is to take a detailed look at a specific area, particularly areas which require urban renewal or where large scale development is expected, identifying and analyzing the various issues of relevance, before establishing and setting out principles for the future development of the area.

Local area plans are intended to provide more detailed planning policies for areas that are expected to experience significant development and change, through proper public participation and democratic oversight. Under the provision of Town & Country Planning and Urban Development Act the Local Area Plan has been proposed discussing with the Dhing M.B at 2 (two) suitable locations in the Dhing Master Plan, 2045.

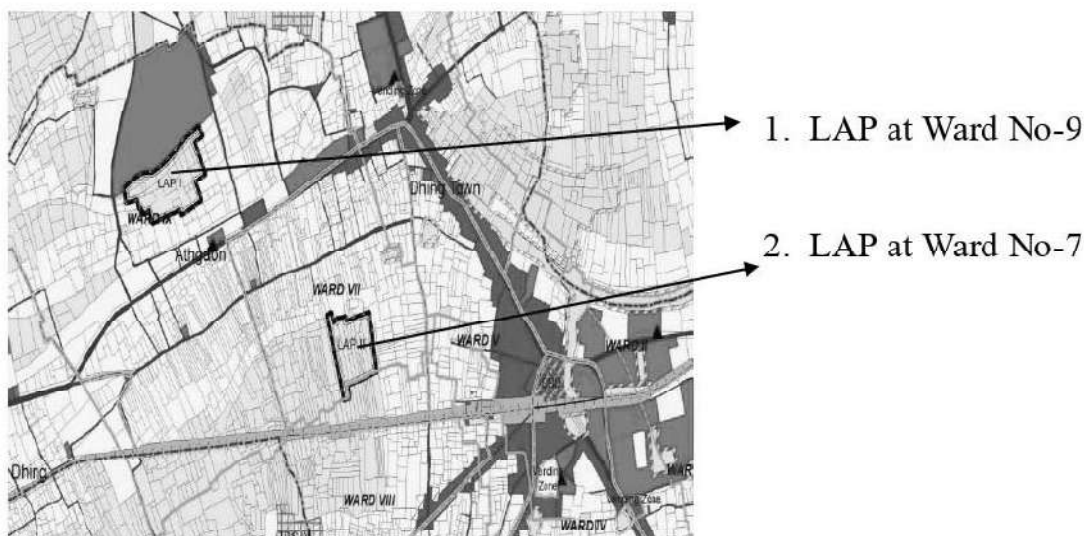


Figure-44

9.3 PROPOSED COMMERCIAL LANDUSE:

With the rapid population growth in Dhing the existing commercial area concentrated along the SH-17 and SH-18 and surrounding the town area will not be sufficient to meet the need of future projected population.

Therefore, an additional area of about **0.87 sq. km.** is proposed for commercial purposes in the Dhing Master Plan area. Area under Commercial zone 3 Nos. of (Threc) Vending Zone is proposed at Dhing weekly market, Near Block Elementary Education Office and Near Circle Office.

9.4 PROPOSED INDUSTRIAL LANDUSE:

There are good prospects for setting up of forest and agricultural based small and medium industries in Dhing Master Plan area. There are also good scopes for setting up of service and light consumer goods producing industries like agriculture implements, readymade garments, soap making, brick making, bakery, plastic goods, power loom etc. In addition to the existing industrial area, an area of about 0.68 sq. km. of land has been earmarked for setting up of medium and light industries in the Dhing Master Plan Area.

9.5 PROPOSED PUBLIC AND SEMI-PUBLIC USE:

In the Dhing Master plan area land proposed for public and semi-public use is **1.56 sq. km.** which is required for proposed as public and semi-public use. The public and semipublic uses have been proposed on Govt. land of Dhing Master Plan Area.

9.6 PROPOSED CIRCULATION PLAN:

The land is proposed under transportation will be 2.2 sq.km. of Dhing Master Plan - 2045. The proposals for improvement and widening of roads within Dhing Master Plan Area. All the major junction points should be developed in a planned manner. Modern traffic signaling system is to be proposed within the Dhing Master Plan Area.

9.6.1 HIERARCHY OF ROAD PROPOSED WITH WIDTH:

- 1) Arterial Road: - 50 to 80 metre width
- 2) Sub Arterial Road: - 30 to 50 metre width
- 3) Collector/Distributor Road: - 12 to 30 metre width
- 4) Local Road:-6.6 to 15 metre width

The Road passing through Athgaon connection Dhing- Bhuragaon road at Niz-Dhing has been proposed as an alternate road.

9.6.2 FIXATION OF ROAD LEVEL OF DHING MASTER PLAN AREA

Road levels to be defined at the Local Area Plan level to ensure integrated road levels with drainage system and slope. No roads to have two different road levels without a proper median or a separator. Repeated excavation of roads damaging the underground utilities and disturbed road levels.

While planning, planners face the problems associated with road levels, lying of new pipelines, parking in residential areas, decongestion, fire safety issues, requirement of road widening and lose of heritage façade, provision of land for social infrastructure and sometimes re-planning underground infrastructure.

Proposed Road Level (RL) of the major Roads of the Dhing Master Plan Area shown in the below:

Table 58:-

SL. No.	Name of the Road	Road Level at Different points (in metre)	Remarks
1	State Highway-47	61, 62, 64, 63,	Shown in the Circulation Map
2	Dhing- Tuktuki Road	63, 61	-do-
3	Dhing to Domdunia Road	63, 67	-do-
4	Dhing Thana Road	64, 63, 62	-do-
5	Bilotia to Auti Ati Satra Road	64, 67	-do-
6	Khairamari-Kandhuli Mari Road	63, 62	-do-
7	Athgaon Road	63, 62, 61	-do-
8	Dhing Chariali-Bhakatgaon Road	64, 61	-do-

Source: - Consultancy

9.7 PROPOSE RECREATIONAL FACILITY:

Existing parks and playgrounds are not available within the Dhing Master Plan area to meet the demand of the people and the condition of the existing parks and playgrounds are deplorable condition which are urgently need to be improved. Thus, an area of 2.65 sq.km has been proposed for recreational facilities (park and playground) for Dhing Master Plan 2045.

9.8 PROPOSED GREEN BELT:

An area of 0.06 sq. km has been proposed for Green Belt within Dhing Master Plan Area. The green belt will act as buffer zone between residential use and other uses with the Master Plan.

9.9 PROPOSED NO CONSTRUCTION ZONE OR BUFFER ZONE

To regulate the construction near water bodies and to conserve rivers and canals, buffer zones around them have been proposed in the Dhing Master Plan Area, and the same has been denoted in the proposed Nature Conservation Map. It indicates the buffer areas prescribed for the conservation of water bodies in the town. This area proposal is made based on the buffer distance fixed for each water body. As the primary objective for the zone is conservation, planned green space development can also be attained in this area. Buffer areas have been proposed along the Leteri Beel, Tolibar Beel and water bodies mainly wetland area, ponds, etc. of the Dhing Master Plan Area.

Buffer width of 15 metres has been proposed along the water bodies inside Municipal Area and 50 metres along the water bodies outside the Water Bodies. A Nature Conservation map has been prepared showing No construction zone or Buffer Zone of Dhing Master Plan Area.

9.10 ZERO POINT OF DHING MASTER PLAN AREA

Free Stationing is a method of determining a location of one unknown point in Relation to known point. There is a zero point of reference called a total station. Zero point is the first starting point from where we can measure distance from one point to another unknown point. In case of preparing Contour Map of Dhing Master Plan area, the zero point or the starting point has been selected as the “Dhing Tiniali” and the co-ordinate of the Zero Point is 26, 27’, 29.14’’ N and 92, 28, 55.24’’ E.

9.11 INFRASTRUCTURE PROPOSALS:

The availability of existing social / physical facilities and their services of Dhing Master Plan area have been studied. The existing deficits and future requirements are calculated as below:-

Education, Health, Socio-cultural facilities and Communication

To accomplish the social and economic upliftment of the society is not possible without the modern and up to date educational system capable of eradicating illiteracy and ignorance and providing skilled and trained up man power required by changing economic condition.

The educational, Health, Socio-Cultural and Communication facilities requirement for Dhing Master Plan area up to the year 2045 has been estimated considering a higher standard as mentioned in the table below:-

Table 59:-

Sl. No.	Type of Educational Institute	Norms	Existing Numbers	Deficit	Requirement
EDUCATION					
1	Primary school	1 in 2500 population	38	7	7
2	Middle school	1 in 5000 population	15	7	7
3	High school	1 in 7500 population	7	8	8
4	Higher Secondary school	1 in 90,000 population	1	1	1
5	General college	1 in 1,25,000 population	1	-	-
Health					
6	Intermediate Hospital	1 in 1,00,000 population	1	1	1
7	Nursing Home, Maternity home	1 in 45,000 population	1	2	2
8	Sub-Dispensary	1 in 15,000 population	7	1	1

Socio-Cultural Facilities:					
9	Community Room	1 in 5000 population	2	20	20
10	Community Hall/ Library	1 in 15,000 population	1	7	7
11	Music Dance & Drama etc.	1 in 1,00,000 population	-	2	2
Communication					
12	Post Office	1 for 15,000 population	1	6	6
13	Police Station	1 for 90,000 population	1	1	1
14	Fire Station	1 for 2,00,000 population	1	-	

Source: - T&C.P compilation

Road and Drain Proposal:-

Within Dhing Master Plan Area total 28 Nos. Roads were proposed for future improvement and widening and 6 Nos. of Drain are proposed for future construction.

Table-60

Improvement and widening of Road		
1	Dhing Tuk-tuki Road	5 km
2	Athgaon Road connects to Dhing Bhurgaon Road at Niz Dhing	3 km
3	Bilotia No.2 Road	4 km
4	Thana Road	3 km
5	Gayangaon Road	7 km
6	Dhing-Bhurgaon Road	3 km
7	NCB To Samabai Rd.	550 m
8	NCB Rd.	950 m
9	Colony Path	500m
10	Subway of ward no.1	300 m
11	Singimari Rd.	450 m
12	Chamua -Panbari Rd.	1330 m
13	Erabari Rd.	220 m
14	Burha Namghar Rd.	1230 m
15	Subway from Sankarnagar to Jyotinagar	560m
16	Bidyanagar Rd.	220 m
17	Subway of RKB Rd.	200 m
18	Muslimpatty Rd.	405 m
19	Subway from I. barphukan1	150 m
20	Kushal kunwar Rd.	350 m
21	Lakhidhar Hazarika Rd.	300 m
22	Kanaklata Rd. subway4	100 m
23	Sibmandir Rd.	570 m
24	Smassan Rd. 2	200 m

25	Niz Dhing Smassan Rd. 2	280 m
26	Musipatty Rd.	220 m
27	Road by the side of Dumping Ground	1000 m
Construction of Drain within Dhing Master Plan Area		
1	Construction of drain both side of the Dhing Tuk-Tuki Road Via Nam Dundoomia	3 km
2	Construction of Drain both side of Dhing Pujabari Road	500 m
3	Construction of Drain both side from Dhing-Chariali Bhokotgaon Rd.	700 m
4	Construction of Drain within Dhing Municipal Area	30 km
5	Construction of Drain both side of Dhing Thana Road	2 km
6	Construction of Drain both side of Dhing State Highway-47	7 km

(Source-Dhing Municipal Board)

9.12 PROPOSALS FOR WATER SUPPLY:**Proposed PWSS**

- (1) Pipe Water Supply Scheme -1,2,3,4,5,6,7,8,9,10
- (2) Pipe Water Supply Scheme-12 Revenue Village

Table:-61

Description	2021	2031	2041	2045
Total Population of Dhing Master Plan Area	59,349	75,114	95,395	1,13,291
Projected Water Demand (MLD)				
Total Water Demand @ 135 LPCD	8.0 MLD	10.0 MLD	12.87 MLD	15.29 MLD
15 % O & M loss	1.2	1.5	1.9	2.29
Sub Total	9.2	11.5	14.77	17.58
2% Fire Fighting	0.18	0.23	0.30	0.35
Total Water Demand	9.38 MLD	11.73 MLD	15.07 MLD	17.93 MLD
Grand Total Water Demand (Say)				
Add 10% extra (Say for defense area, Floating population, Tourism, Service population etc.)	0.94	1.17	1.51	1.79
Overhead Population Water Demand	10.32	12.9	16.58	19.72

Source: - T&C.P compilation

Minimum domestic water supply per capita per day will be 135 liters. There overhead water demand is 19.72 MLD for Dhing Master Plan Area up-to, 2045. Thus, additional water supply schemes or up-gradation of existing water supply schemes will be required for Dhing Master Plan Area-2045.

9.13 SECTOR -WISE INVESTMENT PROPOSAL:

The sector wise requirement of implementation of various projects of Dhing Master Plan Area is detailed as table below:

Table 62:-

SL. NO.	Location	Project Name
Solid Waste management		
1	Dhing Planning Area	Improvement and Modernization of Solid Waste Collection, Transportation and Disposal System of Dhing.
2	Ward No-10, Niz-Dhing Kissed, Dag No-830 (new)	Development of Solid Waste Engineering land fill site on 20 Bigha of Land
Drainage System		
3	Dhing Planning Area	Preparation of DPR for Drainage System for Dhing M.P Area
4	Dhing Town	Construction and Improvement of Existing Storm Water Drains
5	Dhing Town	Cleaning and Maintenance of existing Drains
6.	Dhing Planning Area	Proposal for STP at Athgaon Chapori
Water Bodies		
7	Tolibar Beel	Development of Eco-Tourism Park at Tolibar Beel
8	Dhing Planning Area	Development of Green Belt around all water Bodies.
9	Leteri Beel	Development of River-front Development Project at Ward No-1
Traffic and Transportation		
10	Chamuagaon, Dag No.449	Bus Terminus,
11	Chamuagaon, Dag No.449	Truck Terminus
12	Chamugaon near sub post office.	Construction of Entry Gate
13	Dhing Municipal Area	Construction of 2 wheeler Parking space, Cycle
14	Dhing Weekly Market, Dhing Municipal Area	Construction of Multilevel car parking system and street parking at selected roadside
15	Dhing Tiniali, Dhing-Tuktuki-Jajori Road connecting Rajabari Road Point, Dhing Chariali	Construction of Automatic Traffic Signals Point.
Industrial Area		
16	Dhing Planning Area,	Industrial state
Fly over		
17	Dhing Town Rail Gate, Dhing M.B	Construction of Fly over

Recreational Facility		
18	Auni Ati Satra	Construction Of children Park
19	Saharia Gaon, Dag No-6771	Construction Of children Park
20	Lahkar Ghat, Dag No-290	Construction Of children Park
21	Athgaon Chapori, Dag No-55	Construction Of children Park
22	W/No-3 Chamuagaon, Dag No- 454	Construction of Park
23	W/No-10, Niz Dhing, Dag No-145	Construction of Park
24	W/No-9, Athgaon, Dag No.-133	Construction of Park
Neighbourhood Centre		
25	Auni Ati Satra, Dag No.677	Neighbourhood Centre
26	Saharia Gaon Dag No.677	Neighbourhood Centre
27	Lahkar Ghat Dag No.290	Neighbourhood Centre
28	Athgaon Chapori Dag No.55	Neighbourhood Centre
29	Barbheti	Neighbourhood Centre
30	Tolibar Sonarigaon Ward No-2	Neighbourhood Centre
31	Niz Dhing, Ward No-10	Neighbourhood Centre
Proposal for Town Planning Planning scheme (TPS)		
32	Auni-Ati Satra, Athgaon Chapori, Dhakaya Basti	Proposal for Town Planning Scheme (TPS)
33	Ward No-3, Dhing Municipal Board	Town Planning Scheme with affordable Housing
Proposal for Local Area Plan (LAP)		
34	Ward No-7 & Ward No-9 Dhing Municipal Board	Proposal for Local Planning Scheme (LAP)
Proposal for Vending Zone		
35	Dhing Weekly Market, Block Elementary Education Office, Near Circle Office	Proposal for Vending Zone
Proposal for Development of Cremation & Burial Ground		
36	Cremation Ground at Ward No:-3,9,8 & Chamuagaon and Burial Ground at Ward No.3	Proposal for Development of all the Cremation and Burial Ground of Dhing Planning Area with all necessary facilities.
Proposal for Installation of Fire Hydrant Point		
37	Fire Hydrant connection point's at Dhing weekly market, Near Dhing Circle Office, Near Dhing College, Athgaon Ward No-IX	Proposal for Installation of Fire Hydrant connection point's.



CHAPTER: 10

DISASTER PLAN

Disaster is an undesired calamities event that seriously disrupts the functioning of a community or society and causes human, material and economic or environment losses that exceed the community's or society's ability to cope using its own resources. Disasters are usually caused by nature but in some cases, it can be caused by human actions as well. Disaster can be broadly classified into water and climate related geology related and accidental related. Assam has been traditionally vulnerable to natural disasters on account of its unique geo-climatic conditions. Flood, drought, cyclones, earth quakes and landslides have been recurrent phenomena.

At national level, the ministry of Home affairs is the nodal Ministry for all matters concerning disaster management and at state level State Disaster Response force under Ministry of Home, Govt. of Assam is the responsible agency to tackle any disasters within the State.

Dhing is one of the important town of Nagaon district which is only 29 Km from Nagaon Town. As Dhing town is located on the bank of River Brahmaputra and Lateri Beel, the region is vulnerable to Flood and mainly River bank erosion.

10.1 Mitigation Plan:

Any disaster management plan or emergency management plan consists of four phases, namely: Mitigation, Preparedness, Response and Recovery. The Mitigation component in an emergency management plan is aimed at reducing the risk, impact, effects of a disaster. Hence careful planning eliminate the phase is important to reduce or eliminate the long-term risk to human life, property from natural and manmade calamities. It's important to have mitigation plans led by local community, working together to identify, plan for in the event of a disaster and reduce vulnerabilities and promote long term personal and community resilience and sustainability. Mitigation Plans can concentrate on both pre-disaster and post disaster efforts to reduce the impact of the disaster.

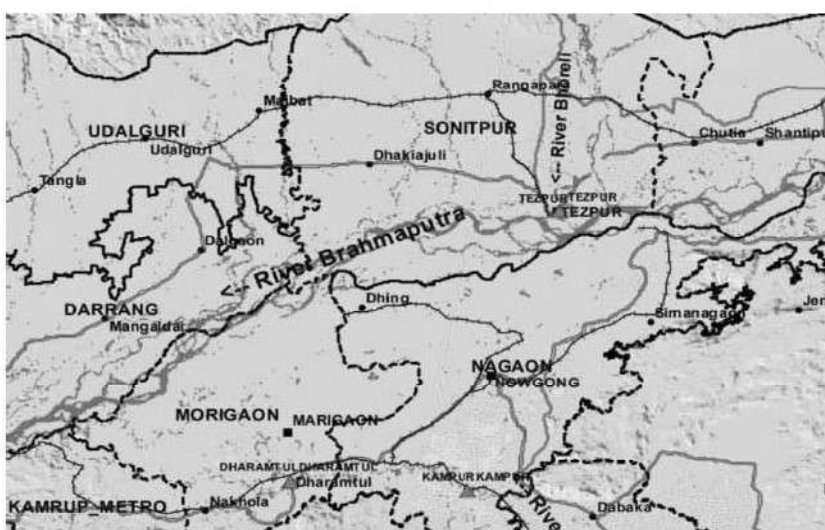
Pre-disaster Mitigation should focus on projects and interventions to address natural and man-made disaster to reduce risk to the population and property. This is mainly achieved by strengthening the resilience of National/state infrastructure. Post- disaster Mitigation efforts are primarily designed to reduce future damage in an affected area and decrease the loss of life and property and life due to the incidents following the disaster. The essential steps of hazard mitigation are:

- (1) Hazards identification
- (2) Vulnerability Analysis
- (3) Defining a Hazard Mitigation Strategy.
- (4) Implementation of Hazard Mitigation Activities and projects

Dhing region is prone to floods than any other natural disasters hence the disaster vulnerable area mitigation plan focuses on flood related eventualities and how can it be mitigated and have better preparedness. It is important to note that disaster management is an integrated task involving various government departments of region and the plan should focus on prevention, preparedness, mitigation, response, and measures.

Flood:

Although the Dhing Municipal Area is not affected by Flood, however some villages of Dhing Master Plan area is prone to Flood as the Lateri Beel drain out towards North-East side of the Master Plan area to reached the mighty Brahmaputra. The Sonarigaon, Sahariagaon were the villages mainly affected by flood of the Master Plan area.



Flood inundated Area surrounding Dhing Area, jun3 2020 satellite data NRSC *Figure-45*

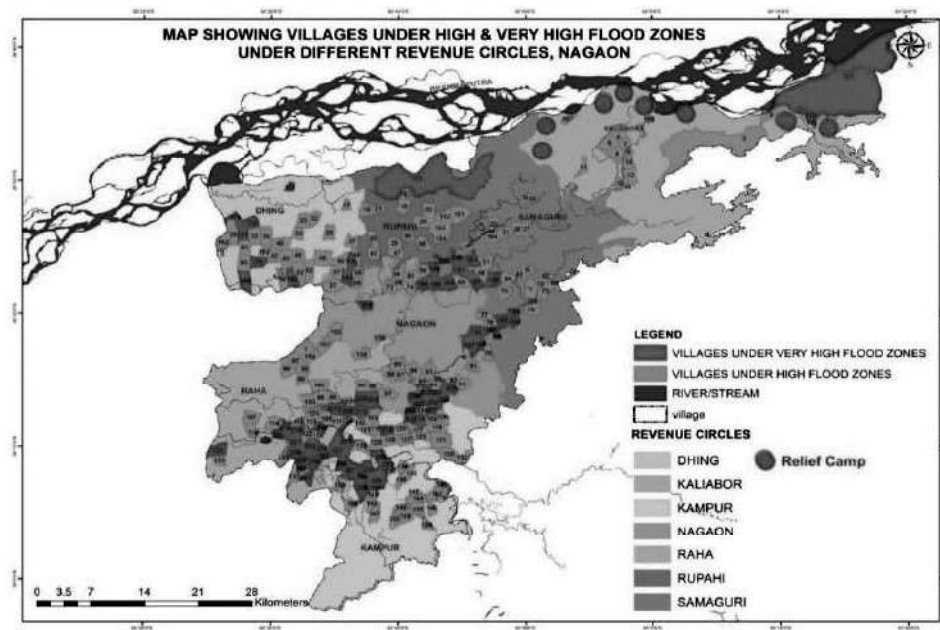


Figure:-46

Bank Erosion:-

The erosion of banks by the rivers and the consequent loss of life and property are major problems. Rivers tend to erode their beds and banks in the hilly regions resulting in the deepening and widening of rivers. The bank line of the River Brahmaputra is extremely unstable consisting mostly of fine sands and silts. Large scale slumping of river banks takes place when the level falls after a flood. Erosion, therefore, has become a serious problem in Rupahihat, Lawkhowa and Dhing area of the district as it eroded the valuable land.

Seasonal Hazard Analysis:

Table-63

Hazards	January	Feb.	March	April	May	June	July	August	Sept	Oct	Nov.	Dec.
Cyclone	X	X	X	X	X	X	X	X	X	X	X	X
Flood					←	←	←	←				
Drought					←	←	←	←				
Earthquake	←	←	←	←	←	←	←	←	←	←	←	←
Fire		←	←									
Lightening				←	←	←	←	←				
Epidemic	←	←	←	←	←	←	←	←	←	←	←	←

(Source:- Department of Disaster Management, Nagaon)

Vulnerability (Risk and Hazards Analysis):**Table:-64**

Types of Hazards	Potential	Vulnerability	Vulnerable areas
Cyclone	Nil	-	-
Flood	Loss of crops, Human lives and animals and properties damage	Communication facility, Agriculture & Horticulture, Private infrastructure Houses, Irrigation sources, Electrical installations, Drinking water sources, Educational institution, and livestock	Surrounding Areas of the Dhing region
Drought	Drought human life and pets	Loss of Human lives & pets	Entire Dhing circle
Earthquake	Human lives & Structures both public & Pvt.	Loss of Human lives & structures both public & pvt.	Entire Dhing Circle
Fire	Lives and property	Loss of Human lives & structures both public & pvt.	Entire Dhing Circle
Epidemic	Human lives & Pets	Loss of Human lives and pets	Entire Dhing Circle
Lightening	Human lives	Loss of Human lives	Entire Dhing Circle

(Source:-District Disaster Management Plan, 2022, DDMA, Nagaon)

Infrastructure vulnerability against Hazards:**Table:-65**

Vulnerability	Flood		Accident		Fire	
	Population	Area	Population	Area	Population	Area
Road network	15, 00,000 appx.	Nagaon sadar, Raha, Kampur, Samaguri, Dhing, Kaliabor Revenue Circle areas 2800 sq k.m	6,25,000 appx	Along NH 36 & 37, SH-17, SH-18 urban area approaching roads.	---	---

Water Supply	15, 00,000 appx.	Nagaon sadar, Raha, Kampur, Samaguri, Dhing, Kaliabor Revenue Circle areas 2800 sq k.m	-----	-----	----	---
Hospital	50,000 appx.	All Development block areas	-----	-----	1500 appx.	Civil Hospital Nagaon
Food stocks & Supplies	15, 00,000 appx.	Nagaon sadar, Raha, kampur, Dhing, Rupahi, samaguri, Kaliabor Revenue circle areas 2800 sq. km	-----	-----	15,00,00 0	Nagaon sadar, Raha, kampur, Dhing, Rupahi, samaguri, Kaliabor Revenue circle areas 2800 sq. km
Communication (system)	15, 00,000 appx.	Nagaon sadar, Raha, kampur, Dhing, Rupahi, samaguri, Kaliabor Revenue circle areas 2800 sq. km	----	-----	-----	-----
Embankments	15,00,000 appx	Nagaon sadar, Raha, kampur, Dhing, Rupahi, samaguri, Kaliabor Revenue circle areas 2800 sq. km	----	----	----	-----
Bridges	15,00,000 appx	Nagaon sadar, Raha, kampur, Dhing, Rupahi, samaguri, Kaliabor Revenue circle areas 2800 sq. km				

(Source:-District Disaster Management Plan, 2022, DDMA, Nagaon)

10.2 Prevention:

As part of the said natural disasters the following measures can be adopted by concerned govt. departments to avoid and minimize the impacts of natural disasters.

1. The public work department should monitor the major water bodies like river, streams lakes for constant flow of water, rising level and identify potential areas along the water bodies which need additional embankment or revetments, and these works should be implemented on priority before the onset of the season.
2. Power and communication should carry out through inspection of power lines, communication lines for defects and rectify them. Trees and branches which may damage power and communication lines should be trimmed or removed.
3. Health department should ensure the primary and community health centers are equipped with medicines and medical staff. Preventive vaccines for epidemics should be stocked in adequate quantity. Chlorination of drinking water should be ensured to avoid the outbreak of epidemics in the event of cyclones and floods.
4. The department of disaster management is the nodal agency in the Nagaon region and has already handled several flood and cyclone situation in the region. From this experience, it should be able to identify the low lying and vulnerable areas and the population of such places must be warned to be alert and to be ready to safer areas or to the relief camps in case of warning disaster.
5. The department of civil supplies & consumer affairs should decide for creation of buffer stock of food grains by making required withdrawal from the food corporation of India. Also, adequate quantities of kerosene and diesel should be procured and made available through the fair price shops.
6. Department of Agriculture should take steps to publicize precautionary measures to be taken to save the standing crops in the vulnerable areas. Farmers should be encouraged to have platforms in their fields to stock the crops. De-silting of the public and private irrigation canals should be ensured for quick drainage of paddy fields.

7. Fisheries Department shall alert all the people residing on river bank villages and hamlets about the impending natural calamities and advice the fisherman not to venture into sea till normalcy is restored.
8. Department of School education shall keep all schools ready for accommodating the evacuees and keep the central kitchens to function around the clock with in charge of the centres. NCC and NSS students shall also be grouped to send them for relief works.
9. Department of Animal Husbandry should store fodder, cattle feed, and poultry food etc. and also carries out the inoculation of animals against epidemics. The Key village units should harbor stray cattle with shelters.
10. Transport Department should keep ready the list of sufficient numbers of earthmoving vehicles, transportation vehicles such as trucks, tractors, tippers, proclaims mini buses etc. Further, all the listed vehicle allocated in connection with calamity has to be kept in roadworthy condition for using them in emergency.
11. Local Urban Bodies/Municipal Board shall make rearrangement for availability of Generators and pump sets at short notice. For areas with water logging and artificial flood local bodies should clear the L & U type drained which normally clog due to plastic materials and silt.
12. Police department shall set up a Search & Rescue Team which shall contain at least 20 police personal for each jurisdiction of the superintendent of police.
13. Similarly, the fire services department shall set up search & Rescue Team consisting of at least 6 members of each fire station.

10.3 Mitigation and Preparedness:

Pre-disaster planning consists of activities such as disaster mitigation and disaster preparedness. Disaster mitigation focuses on the hazard that causes the disaster and tries to eliminate or drastically reduce its effects. The best example of mitigation is the construction of embankments and construction of proper drainage system in flood prone areas to avoid floods. The other example includes retrofitting of weak buildings to make them earthquake resistant. And preparedness focuses on plans to respond to a disaster threat or occurrence. It takes into account estimation of emergency needs and identifies the resources to meet the needs.

The first objective of the preparedness is to reduce the disaster impact through appropriate actions and improve the capacity of those who are likely to be improving the capacity of those who are likely to be affected most. The second is to ensure that ongoing development continues to improve the capacities and capabilities of the system to strengthen preparedness efforts at community level. Finally, it guides reconstruction so as to ensure reduction in vulnerability. The best example of preparedness activities are the development of community awareness and sanitization system through community education and administrative preparedness by way of stockpiling of supplies, developing emergency plans for rescue and relief. For successful mitigation plan it is necessary to identify short- medium-long term mitigation measures risks and damages.

The following steps can be taken to reduce the risk in the unfortunate event of the said natural disasters.

1. Restore communication networks
2. The task force in association with reach and rescue teams of police and fire should thoroughly search the affected area for survivors and injured.
3. In case of heavy flooding and inundation, vehicular access may be restricted and hence suitable rafts/boats should use to rescue and evacuate the people affected by the floods
4. Water logging in low lying residential areas should be pumped out and the pump out water could be let out through the nearest natural drain or canal. Also fire engines can be deployed to pump out water from affected areas during emergencies.
5. Any breach in rivers, streams or natural drains should be protected with adequate sand bags or creation of temporary embankments to avoid further damage to property and human life
6. In case of heavy storms, power supply to areas which are in the primary path of the storm can be disconnected to avoid hazards due to breakage of power lines. Provisions should be made to provide generations for temporary power supply to storm affected areas.
7. Relief camps should be opened in appropriate location where a large number of people are affected.

Table: 66- Mitigation

Type of Sector	Sub-sector	Mitigation Measures	Responsible Dept.	Time frame
Infrastructure Development	Road	Repair, Restoration of vulnerable points on roads before onset of monsoon	PWD/DRDA	During Normal time and immediately
	Embankments	Repair of vulnerable points in river/canal embankment during free flood period	Water Resources/Irrigation	During Normal time and immediately
	Bridge	Repair, restoration of vulnerable points on bridge before onset of flood	PWD, NH	During Normal time
	Communication	Ensure maintenance and proper functioning of electronic communication system	BSNL	Round the year
	Drinking water	Replacement of tube well/pipe water	PHE/ Health Deppt..	During Normal time and immediately
	Power	Immediate response for repair of electric line and supply	PWD, ASEB	Round the year
Health	Vaccination	Adequate stock piling of vaccines should be ensured	CMO, DVO, NGO,s	During Normal time and immediately
	Training	Training Programed of common people should be programmed for Health care, sanitation and first aid from village level to district.	CMO, DVO, NGO,s	During Normal period
Livelihood	Awareness	Creating awareness among general public during normal time to insured human life	Leading NGO,s	During Normal time
	Agriculture	Alternant cropping pattern/flood resistance crops/crops insurance etc.	Dy. Director Agriculture	During normal time and immediately after disaster.
Planning and Response	Relief/Rehabilitation	Regular updation of departmental contingency plan, Community awareness and involvement of NGO,s Regular conduct of mock drill	Line Departments	During Normal time

(Source:-District Disaster Management Plan, 2020, DDMA, Nagaon)

10.4 Response Plan:

Response measures are those taken immediately prior to and following disaster impact. It is important to have clear organizational chart structures with established line of authority within the Government mechanism to handle the response plan in case of natural calamities. Response plans include formation of functional teams and providing plans for the transportation, evacuation, search and rescue and rehabilitation. Survey and assessment part should be the part of response activity. Coordinated IEC activities should be initiated well in advance

1. Mock Drill should carry out twice a year.
2. Make separate plan of operation and list of required materials, tools, machineries for each kind of disaster.
3. Train the rescue team with equipment's
4. Train the panchayat leaders, Municipal leaders, Volunteers etc.
5. Approach to NDMA and SDMA for any kind of assistance.
6. Incident Command Officer shall organize regular coordination meeting with all DM committee members, Head of Offices, Public leaders, NGO,s and Senior citizen in consultation with the chairman
7. The RRT,s (Medical & Police) will be alerted by the incident Command Officer.

10.5 Aim of Disaster Response:

1. To ensure the survival of the maximum possible number of victims, keeping them in the best possible Health in the circumstances.
2. To re-established self-sufficiency and essential services as quickly as possible for all population group.
3. To repair or replace damaged infrastructure and regenerate viable economic activities.
4. In situation of civil conflict the aim is to protect and assist the civilian population.
5. In case involving population displacement the aim is to find durable solutions as quickly as possible.

10.6 Relief:**During the disaster**

1. Disseminate the warning of disaster from DDR & IC to all concerned destination in single attempt by using mass sms, announcement through radio, social media, print media and ask the people who are likely to be affected, to take shelter in safer places.
2. Immediate deploy the forces to clear the route of search & rescue and also to clear the traffic from the route of rescue
3. Command to the forces, NGO,s. SHG,s & volunteers to rush immediately to the affected area for search and rescue with all pre listed tools, equipment for disaster.

10.7 City Disaster Management Plan:

The points mentioned above should be part of a city or region level disaster management Plan. The Disaster Management Act, 2005 has brought a change from response & relief oriented approach. This has encouraged many cities to formulate a city disaster management plan, the same should be worked for Dhing MPA as well to enable it to be better prepared in case of natural disasters in the future. As part of Master Plan 2045 the authority feels there is a need for a CDMP for the Planning area covering the following general principles-

1. Risk & Hazard Assessment
2. Planning
3. Organization
4. Resource Utilization
5. Need for Specialist
6. Training

Generally, the CDMP prepared for the planning area should include sectoral plans covering the following aspects of disaster & emergency management:-

1. Overall Preparedness
2. Emergency Response
3. Prevention
4. Mitigation
5. Recovery
6. Reconstruction
7. Capacity Building Plans

